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System and Method for Telecommunications, for the Payment of Costs, for
Medical Monitoring and for Games

The invention relates to systems and methods for telecommunications, for the payment of costs, for medical monitoring and for games according to the preambles of the independent claims.

Modern telecommunications systems are designed so that they can be used to carry out individual communications selectable depending on addressee and contents. Modern terminal devices are increasingly provided with an optical display used for displaying information concerning the administration and organisation in addition to the acoustic system.

Common payment systems are, in addition to cash, cheques or credit card systems, the credit analysis being carried out by banks or credit card providers for the latter in accordance with information and knowledge obtained earlier.

Medical monitoring systems usually comprise electronic devices by which measurements (of, for example, blood pressure, pulse rate, temperature, blood values) can be carried out. As far as such devices are employed in households, usually only a limited access to expert knowledge including an accompanying qualified analysis of the obtained data are possible.

Known gambling systems usually operate so that lottery tickets and betting slips are purchased and possibly handed in in a conventional way. The player is then to observe whether he has won, and he is to claim the gain if necessary.

From the DE 19707681 C1 a mobile telephone comprising electrocardiogram electrodes is known which can be included in a positioning system.

From the article "Börsenkurse per Handy" in "Der Spiegel" of March 29, 1999, page 82, the transmission of information such as the weather forecast, stock market information, flight information, lottery numbers or soccer results, possibly selectable by a user, to a mobile telephone for a fee is known.

It is the object of the invention to specify systems and methods for telecommunications, for the payment of costs, for medical monitoring and for games using modern telecommunications systems.

Said object is solved by the features of the independent claims. The dependent claims are directed to preferred embodiments of the invention.

A telecommunications system can be designed so that it allows the transmission of non-individual information to a terminal device in addition to the switching of individually shapable information (such as a telephone call between two subscribers). Said information may be of the general type, such as the weather forecast, event guides, advertisements, etc. The non-individual information may be of optical and/or acoustic nature. The system may be designed so that the user of a terminal device can determine whether he wishes to allow the transmission of non-individual information to his terminal device or not. The admission of the transmission may influence the accounting or settlement mode. When user information is transmitted as non-individual information (weather forecast, event reports), the user of the terminal device may be charged with a more expensive rate or with an additional sum. When the non-individual information is of advertising nature, the user may be granted a credit or a more advantageous rate.

"Individually shapable" Information in the sense of the present application may be information directed to individual addressees, for example the contents of a telephone call between two subscribers, an eMail, a fax or the like. Within the scope of the present application "non-individual" Information may be information sent to a plurality of receivers without discrimination between individual receivers, for example, simultaneously or successively, possibly depending on certain system states. Non-individual information, however, may have certain specifications. It may, for example, be specifically intended for certain user parameters known to the system (for example age group, gender, income), appropriate filters being provided in the fixed transmitter and/or in the receiver in this case; or the non-individual information may be regionally specified, for example by having different fixed transmitter facilities transmit different non-individual information. The non-individual information may be from an information source which inputs different information in a locally differentiating manner (for example depending on geographic regions, such as towns, counties, etc.) and transmits them to the terminal device. The terminal device may particularly be a mobile telephone.

A payment system according to the invention may also use a telecommunications device, for example a terminal device such as a mobile telephone. A cost detection facility (for example a cash register in a department store, a petrol pump at a gasoline station, the calculation of fees for a newspaper subscription) detects accumulating costs. At a certain or desired payment time data relating to the desired payment operation are transmitted to a second telecommunications device associated with the client or debtor by the cost detection facility via a first telecommunications device connected to it. It will, specifically, be the amount, the receiver, the date, etc. Through the second telecommunications device belonging/associated to the debtor payment may be effected so that an accounting means generates a debit entry for the debtor and a credit entry for the creditor. The accounting means may, for example, be the one of the telecommunications provider or the one of a financial institution. Payment may be effected by entry of a code. The utilisation of this mode of payment

may influence the invoice for the telecommunications services used by the user, for example in such a manner that he will receive credits or more advantageous rates. The second telecommunications device may be a mobile telephone.

In the course of the operation a credit analysis of the debtor may be effected. It is preferably carried out before the credit entry or debit entry is generated. In this case previously obtained data and the behaviour of the debtor experienced earlier may be referred to.

A medical monitoring system according to the invention comprises a medical diagnostic device generating electronic data and a telecommunications device receiving the data from the diagnostic device and transferring them via a telecommunications system. The receiver of the transmission may be an automatic analysis or data base system or a medical doctor or the like. The data received there may be analysed and processed. Depending on the result information such as messages of a general type, information on the result of the diagnosis, certain instructions or the like may be supplied to the system user via his telecommunication device.

A game system according to the invention, particularly a gambling system comprises a central administration facility which can, on the one hand, carry out or control the actual game operations and will, on the other hand, detect the subscriber costs for these in a cost detection facility. The administration facility is connected to a telecommunications system via a terminal device, e.g. a modem. A player may transfer data to the administration facility via a terminal device associated to him, particularly to make entries relevant for the game, for example to buy a ticket, to bet on specific numbers or the like. The costs for that are determined by the cost detection facility. Further, invoicing is then effected by the payment system as described above.

According to the invention, systems for telecommunications, for the payment of due amounts, for medical monitoring and for the participation in games are described. The systems particularly serve the realisation of the respective methods

and comprise particularly the components designed or required for carrying out the individual steps. The methods reflect the interaction of the individual components.

All mentioned aspects may be implemented individually or in any combination.

As far as systems are discussed, the complete systems as well as their individual components, particularly as far as they are system-specifically individualised, are regarded as part of the invention.

Below, individual embodiments of the invention are described with reference to the drawings in which:

- Fig. 1 a schematic block diagram of a telecommunications system according to the invention;
- Fig. 2 a schematic block diagram of a payment system according to the invention;
- Fig. 3 a schematic block diagram of a medical monitoring system according to the invention; and
- Fig. 4 a schematic block diagram of a gambling system according to the invention.

Fig. 1 shows a telecommunications systems comprising terminal devices 100 or 120. 120 is a stationary terminal device, for example a telephone. 100 is a mobile telephone. It comprises a display 101, a loudspeaker 102, control keys 103, number keys 104, an antenna 105 and a microphone 106. It communicates with a stationary antenna or transmitters 130 via radio transmission.

110 indicates an exchange system which may provide connections between individual subscribers. Said subscribers may then exchange individually shapable information, for example by talking or by transmitting a fax.

According to the invention, further an information source 140 is provided which supplies non-individual information to a participant or his terminal device 100, 120. Said information may be informative indications (event guides, weather

forecast, traffic information, etc.) or advertisements. A combination of both is possible. Even though the illustration of Fig. 1 shows information source 140 as another subscriber it is to be noted that the information source is usually centrally provided and can therefore rather be regarded as integrated into the exchange system 110. The information source may also be associated to a specific transmitter 130. Information sources 140 associated to different transmitters may transmit identical and/or different information.

A release facility 150, 151 may be provided which blocks or releases the transmission of the non-individual information from the information source 140. The release facility 150, 151 may act subscriber-specific or terminal device-specific. It may be operable by the user of the terminal or terminal device. The operation may either be effected "on-line" (for example, by dealing a specific service provider and carrying out specific adjustments) or "off-line" (written instruction for release or cut-off). The release or cut-off will then be effective only for a specific terminal device. If, for example, the user of the mobile telephone 100 releases the reception of the non-individual information from the information source 140, said information reaches, a priori, only his terminal device 100, but not automatically also to another terminal device, for example 120.

In the system an accounting facility 160 is provided which carries out the invoicing for telecommunications services for the individual subscribers or terminal devices in the usual way. The system may be designed so that the operation of the release means influences invoicing in the accounting facility. If user information is reproduced, this may lead to charges or a more expensive rate for the respective user, if or as soon as the transmission of the non-individual information is released. If, on the contrary, advertisements are transmitted, this may lead to credits or a more advantageous rate. If a mixture of both kinds of information is reproduced, invoicing may remain unaffected.

For transmitting the non-individual information from the information source 140 an independent protocol may be used which is adjusted to specific demands. In the terminal device, for example, menu-like illustrations may be implemented (hotels, movie theatres, restaurants, events, traffic, these, for example, regionally differentiated, weather), which themselves have sub-menus.

Non-individual information from the information source 140 is not user-specific, it may, however, be specified socio-economically or regionally specified. In this way, information sources 140 having different contents may be assigned to different regional exchange facilities so that, for example, a user in the area of Gunzenhausen would only receive hotels, movie theatres and events in the area of Gunzenhausen via the transmitter associated to this area.

As far as the offered non-individual information is of advertising nature, a bonus system may be implemented in accordance with the release status of the non-individual information. No direct influence on the accounting 160 is effected. There will rather be a recording in a recording facility 170 in which the number or frequency and/or length of the reception of advertising information is recorded. In this case balances, credits or deposits may be developed which may be used in a specified way.

With respect to the reproduction of non-individual information of advertising nature, further, a confirmation mechanism may be provided on the terminal device. It may be designed so that the user of the terminal device confirms the reception of an advertising message on the terminal device, for example by operating a key. This may, particularly, be implemented so that a key specified by the non-individual information is to be pressed. In this way it is assured that the user of the terminal device will apprehend the non-individual information. Such operation information may be collected in the terminal device and/or transmitted to the exchange system 110. This may specifically lead to an influence on invoicing 160 via

another facility 180. Particularly, more advantageous rates or credits may be initiated by the confirmation of the information.

In the terminal device a timer may be provided which detects the time of the reception of the non-individual information, specifically the time of confirmation. There may be a correlation between the time of reception or confirmation and other data. The time and/or correlation results may be transmitted to the exchange system as described above.

The terminal device may, for example, offer the non-individual information at the start of utilisation (when turning the device on) after a longer pause, for example optically, or after the termination of a telephone call (after pressing the "hang up" key). The information may as well be permanently displayed or displayed in the "free periods". If the confirmation mechanism described above is provided, a request, for example "press 9", may be provided in addition to an advertising information. The terminal device may be designed so that a further operation is only possible when the demanded key is operated. It may also be designed so that an operation of the device is also possible without an operation of the indicated key. Then, however, there will be no consideration in the facility 180.

A terminal device adapted according to the invention may have one or more of the following features: a large display with a higher resolution and more brilliant colours, an automatic call to the exchange system 110 for a feedback of possibly accumulated confirmations, an extended memory for storing additional software, protocols or other data, enhanced energy management in mobile telephones.

Particularly in case of non-individual information of advertising nature a stacked credit system may be implemented: Upon release of the information source 140 for a subscriber a first credit note is entered for said user (means 150). Depending on possibly carried out confirmations of the transmitted advertising information a further credit note is entered (means 180).

Fig. 2 shows a payment system according to the invention. It comprises a cost detection facility 220 by which costs to be paid are detected. It may, for example, be a cash register of a department store, a corresponding terminal, for example in a travel agency, a petrol pump of a gasoline station or a computer generating invoices for certain services (for example for an electricity generating plant, a newspaper subscription, etc.). In the cost detecting facility 220 the costs to be paid are detected, possibly accumulated over specified periods and indicated as due for payment earlier or later. Then a transmission of data relating to the payment from the cost detecting facility to a telecommunications device 200, 210 associated with debtor will be effected. The transmitted data may specifically include the amount, possibly the name of the debtor (if known), the creditor as well as general indications.

The connection between the cost detecting facility and the telecommunications device associated with the debtor may be activated by the cost detecting facility or by the debtor. In particular, a telephone number may be assigned to a cost detecting facility 220. For example, a telephone number may be assigned to each petrol pump in case of a plurality of petrol pumps at a gasoline station, said telephone number being given on the petrol pump so as to be clearly visible. Upon termination of the tank-up operation the debtor calls the specified telephone number via his mobile telephone and receives data and/or indications related to the payment to be effected on his mobile telephone.

The telecommunications device assigned to the debtor may be a stationary telephone 210 or a mobile telephone 200 (comprising an optical display 201, a loudspeaker 202, control keys 203, number keys 204, an antenna 205 and a microphone 206).

The payment of the amount may be effected via the telecommunications device 200, 210. The payment may, for example, be effected by the entry of a code known only to the legitimate owner of the terminal device. For example, the person

identification number (PIN) assigned to a mobile telephone may be entered. Following this confirmation an accounting facility 240 accessible via the telecommunications exchange system 230 may produce a balance by producing a debit note 241 for the debtor (the owner of the telecommunications device 200, 210) and a credit note 242 for the owner of the cost detecting facility 220.

In Fig. 2 an accounting facility 240 is schematically shown. It is illustrated as a subscriber in the communications system. This is one possible implementation. It may, for example, be a bank. Upon confirmation on the terminal device of the debtor the accounting device would be automatically called, and the credit and debit notes would be generated as described above.

Another possibility is the utilisation of the accounting facility of the telecommunications service provider. The accounting device is then not to be considered a subscriber of the system but rather an inherent system component.

The accounting may also be effected by an interaction between the telecommunications service provider and another organisation, for example a bank. The telecommunications service provider collects data related to the payment process (for example amount, debtor, creditor, confirmation, time, etc.) and transmits them, possibly together with data relating to other payment processes, for example to a financial institution which then initiates the corresponding operations.

As far as effective debits are to be produced for a client, it is generally assured that the client will accept the described kind of monetary transaction as binding for himself by previous agreement.

241 symbolises an account of the debtor, 242 an account of the creditor. As far as the accounting facility of the telecommunications service provider is used these may, for example, be the accounts in which also the costs for the used telecommunications services are registered. In addition, the mentioned credit and debit notes may be entered into these accounts.

Before the payment is actually effected (the credit and debit notes are generated) a credit analysis may be carried out. It can be effected automatically and be carried out in accordance with the agreements with the clients, knowledge concerning the solvency, etc. Such data may be stored in a database 243 which the accounting means can access. The credit analysis may be carried out immediately after the data have been sent off by the cost detection facility or after the confirmation by the user via the terminal device 200, 210. When the credit analysis indicates that the user is able to make a payment principally and in the determined amount, the payment is effected (generation of the credit or debit note). A corresponding confirmation may be sent to the creditor and the debtor. When the credit analysis indicates a deficiency the payment may be refused.

The creditor and/or the debtor may receive credits for using said payment method. As far as the accounting system of a telecommunications service provider is used, the utilisation of the described payment method may, for example, lead to the setting of a more advantageous rate.

Fig. 2 schematically shows the embodiment on the side of the cost detection facility. The cost detecting facility may be embodied in the conventional way in the narrower sense. In addition, it comprises a control means 222 collecting the data relevant for the mode of payment according to the invention, possibly processes them and carries out general control operations. A telecommunications device 221, for example a modem or an ISDN card, handles the required data traffic, preferably in accordance with the control means 222. On the side of the accounting means 240 also a separate telecommunications device 244 may be provided, for example a modem or an ISDN card.

On the side of the telecommunications device of the user of the mode of payment adjustments may be carried out so that certain protocols and sequences are stored and retrievable. Further, certain security measures may be provided. For ex-

ample, a CPU having an own identifier for securing it against abuse may be provided. In addition, certain or specific codes may be added if required.

Fig. 3 shows a medical monitoring system according to the invention. It is particularly suitable for medical monitoring which the patients can or wish to carry out themselves, particularly outside of specialised facilities such as a doctor's office or a hospital.

The system is provided with a medical diagnostic device which can generate at least electronic data, preferably of digital nature. It may, for example, be electronic thermometers, hemomanometers, electromyography devices, blood value measuring devices or the like. The diagnostic device is at least connectable to a telecommunications device. It is preferably integrated with or in the same. Fig. 3 shows such an embodiment. The telecommunications device 300 comprising a display 301, a loudspeaker 302, control keys 303, a number block 304, an antenna 305 and a microphone 306 includes, for example, electrodes 307 for detecting muscle action potentials (potential differences on the skin). 308 alternatively or additionally identifies a temperature sensor.

The data detected by the diagnostic device are transmitted by the telecommunications device 300 via a telecommunications system 320. The receiver may be an analysis facility 320 in the widest sense. It comprises a telecommunications device 325 itself, for example a telephone, a modem or an ISDN card. A monitoring facility 322 may be provided for analysing the received data. The analysis may comprise: correlation of the data among each other, correlation with data obtained earlier, comparison of the data with threshold values, access to data bases 324 (either - as shown - locally or again via a communications system 110). Following the monitoring a message may be sent to the user via a facility 323 (for example "You are fine!", "See a doctor!", "Continue monitoring the Temperature"). This may be effected automatically. The message may be delivered acoustically and/or optically, for example by means of an automatic call delivering a spoken message.

Additionally, a reminder means 321 may be provided. It reminds the user of the system to carry out certain actions by means of a message to his telecommunications device 300. It may be designed so that it will only be activated (that it will only send a reminder to the user) when expected values will not arrive in time, when they are, for example, delayed by a certain period.

The reminder function may as well be used without the diagnostic function, for example to remind the user to take certain drugs. The user side telecommunications device 300 may then have a conventional design. The reminder facility 321 may operate in accordance with the results of the monitoring facility 322.

For data transmission a separate protocol may be used. Codes may be provided. The accounting for the used services may be effected in a conventional way or as described with reference to Fig. 2.

The method has the advantage that examinations may be carried out at home while access to comprehensive expert knowledge is enabled by the transmission of the data to a specially designed facility. There funded evaluations can be carried out, and further measures may be initiated.

The integrated diagnostic and telecommunications device has, on the one hand, the features of a mobile telephone (usually a display 301, a loudspeaker 302, control keys 303, a number block 304, an antenna 305 and a microphone 306), and comprises, on the other hand, diagnostic devices (for example electrodes 307 for measuring muscle action potentials or for generating an electrocardiogram and/or a temperature sensor area 308). In addition, appropriate signal conversion and processing means are provided for converting the data obtained by the diagnostic devices and for processing them in an appropriate manner. Finally an interface between the diagnostic device and the mobile transmitter is provided to enable data transmission. Means for implementing specified protocols may be provided. On the receiver side also means are provided which work with the same protocols.

Fig. 4 shows a game system, particularly a gambling system. It comprises a telecommunications device 100, particularly a mobile telephone. It may be used to call an administration facility 400 carrying out the measurements required for the game and storing data via an exchange network 110. Said system may, for example be a lottery system in which a player may bet on numbers, the selected numbers are stored in the administration facility, are later on compared to the actually drawn numbers, and messages are sent to the players in accordance with the results.

The game system according to the invention is capable of carrying out operations relevant for the game, for example of buying lottery tickets or of betting on numbers, via the telecommunications device. To this end, suitable protocols may be provided on the transmitter and on the receiver side. In the administration facility 400 the entries are checked for formal admissibility (for example, whether they are complete and on schedule, etc.).

Furthermore the costs of the desired game may be obtained and charged in a cost detection facility 220. Payment may be effected as described with reference to Fig. 2. The received data relevant for the game are finally stored in a memory or database 420. The binding acceptance of the entered data may depend on the effective payment.

When the result of the game is known, a message can be automatically sent to the telecommunications device 100 of the user ("Congratulations, you have won 0.70 Euro!").

A reminder function or component may be provided to remind the user to carry out actions relevant for the game, particularly if these are limited in time (for example in case of a lottery). The reminder can be sent optically and/or acoustically, for example by an automatic call delivering a spoken message. At certain times then suitable data and/or messages may be transmitted to the terminal device of the user.

On the side of the administration facility 400 also a telecommunications device 410 is provided, for example a modem or an ISDN card.

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